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# Application of STEP Technology to Ship Repair Data Management

Manuel Ventura

[manuel.ventura@ist.utl.pt](mailto:manuel.ventura@ist.utl.pt)

Unit of Marine Technology and Engineering

# Summary

- Introduction
- Management of Documents in the Ship Repair Process
- Actors
- Documents
- Data Modelling
- System implementation
- Conclusions

# Evolution of STEP Standards

- In general the development of ISO standards has a slow formal process
- The huge scope of the STEP Ship Product Model makes this particular development even slower
- Software vendors are not willing to invest too much in alternatives not yet fully developed
- Reduced number of commercially available products
- Decrease in interest by the industry (shipyards)
- Development of STEP is slowing down in Europe

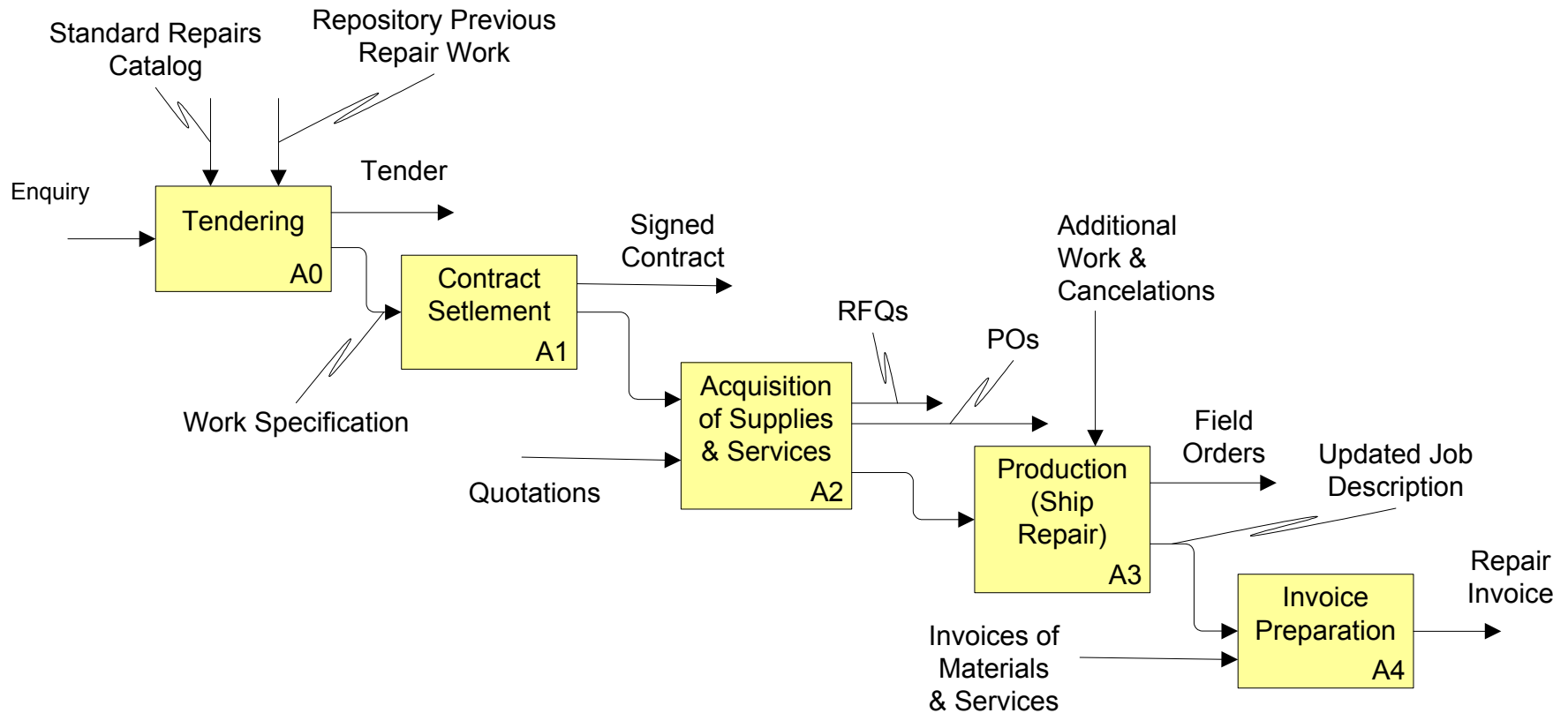
# Motivation

- Background
  - Previous research work in development of STEP AP216 and AP218 translators and interfaces to existing or prototype systems
- Test the use of STEP technology in a different context to solve smaller problems
- Application to the improvement of ship repair process
- Focus on data exchange management critical for the negotiation processes

# Introduction

- Ship Repair Data Exchange scenario:
  - Several actors involved
  - Documents with different internal formats
  - Different management systems (if any)
  - Common core of information contents
- Objective:
  - Improve negotiation processes
- How ?
  - Reducing response time
  - Reducing re-introduction of data
  - Documents available on computer readable formats
  - Ready for Internet based exchange and display

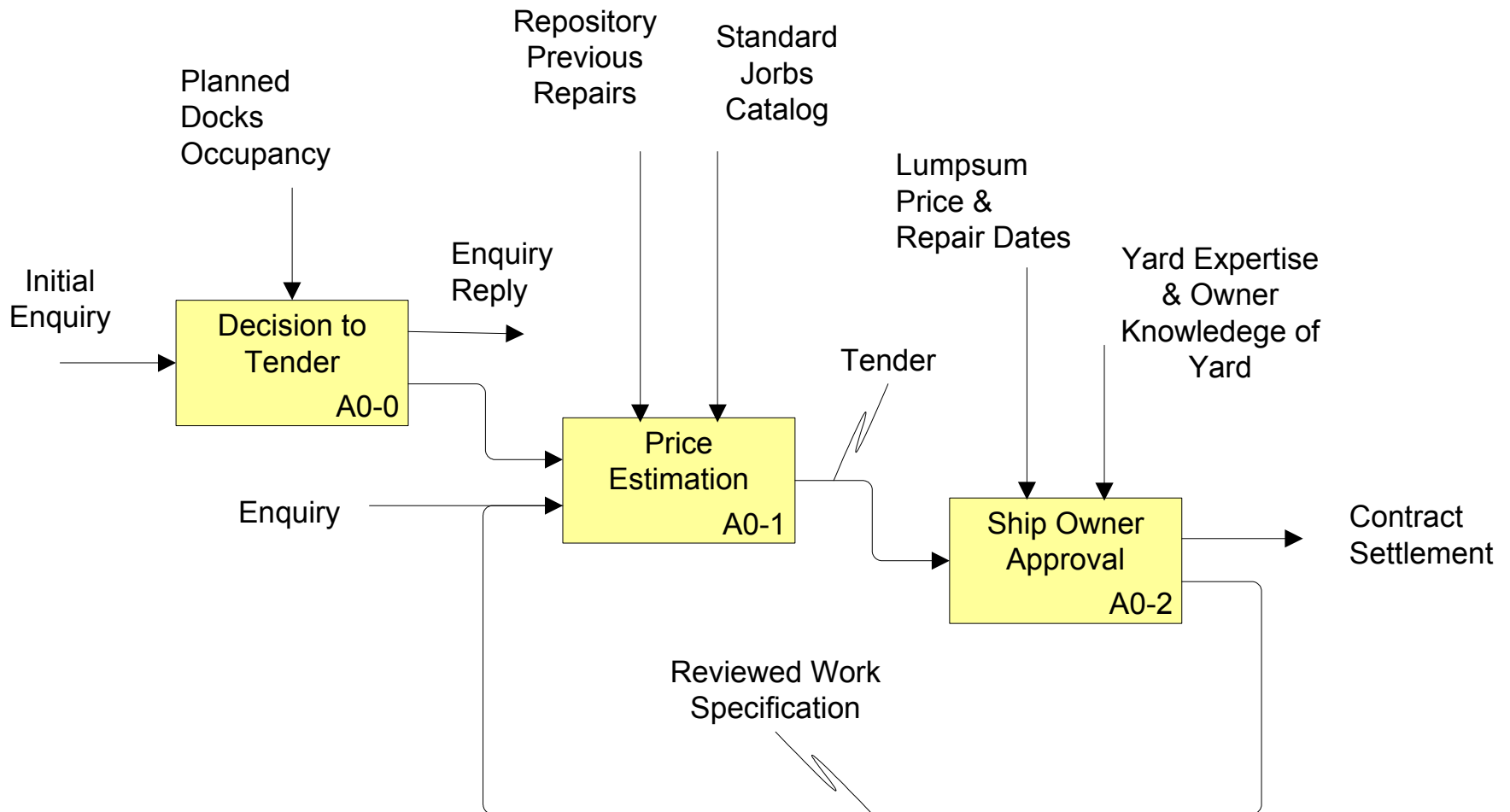
# Data Exchange During Ship Repair





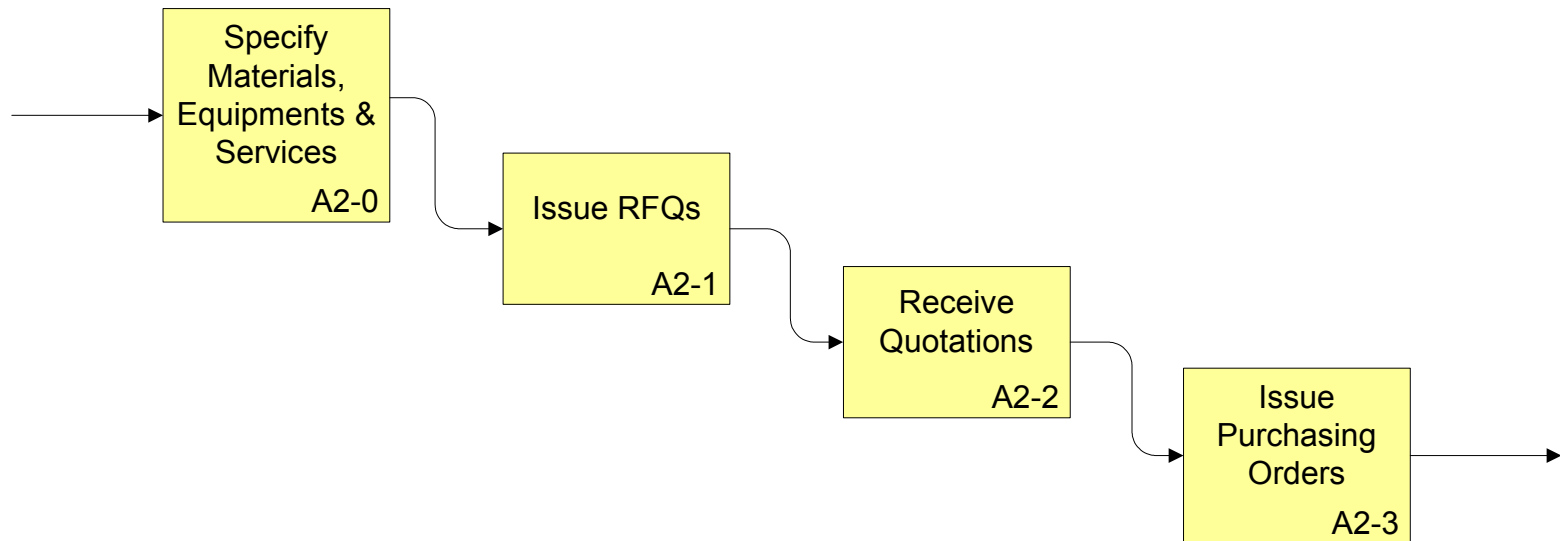
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# Repair Tendering





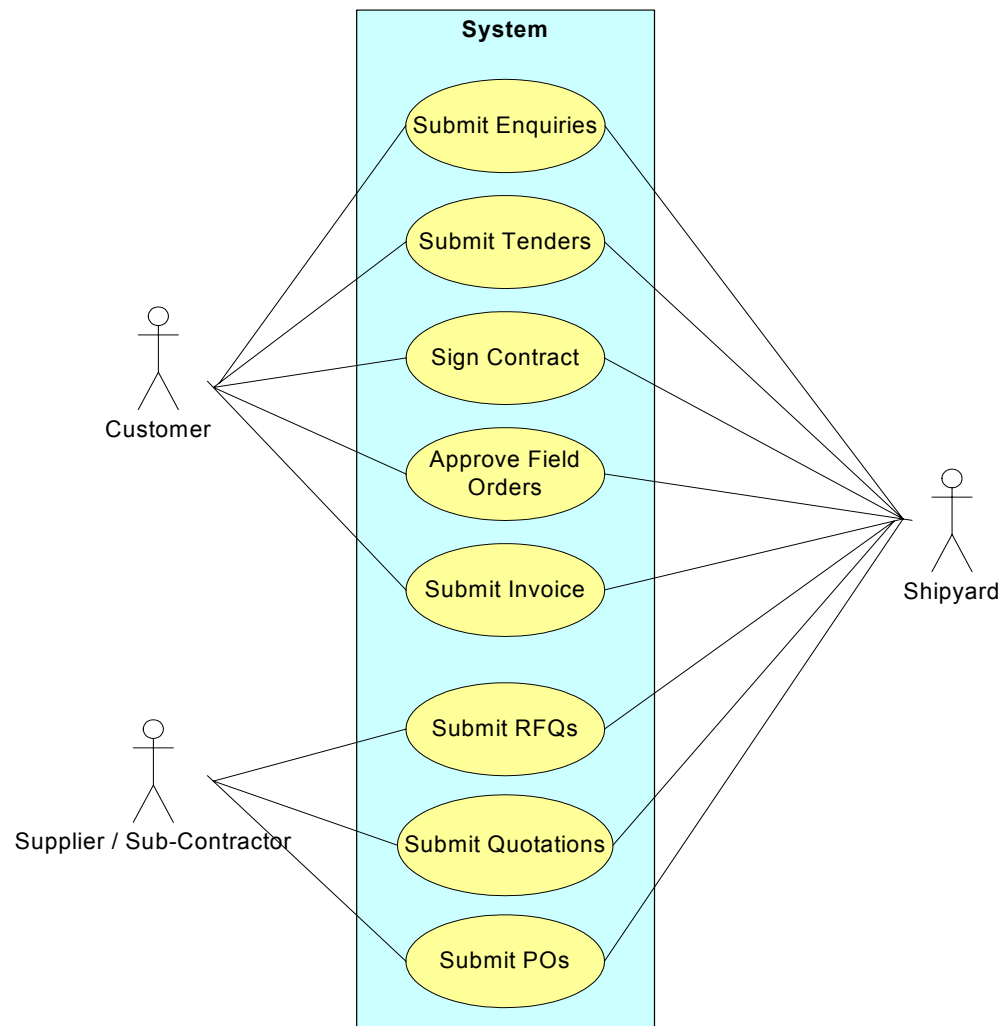
# Purchasing of Supplies and Services







# Use Cases



# Actors

- Customers
  - Ship Owner
  - Ship Agent
- Shipyard
- Suppliers
- Sub-Contractors

# Documents Involved

- Enquiry
- Tender
- Docking Contract
- Request for Quotation
- Quotation
- Purchase Order
- Field Order
- Repair Invoice

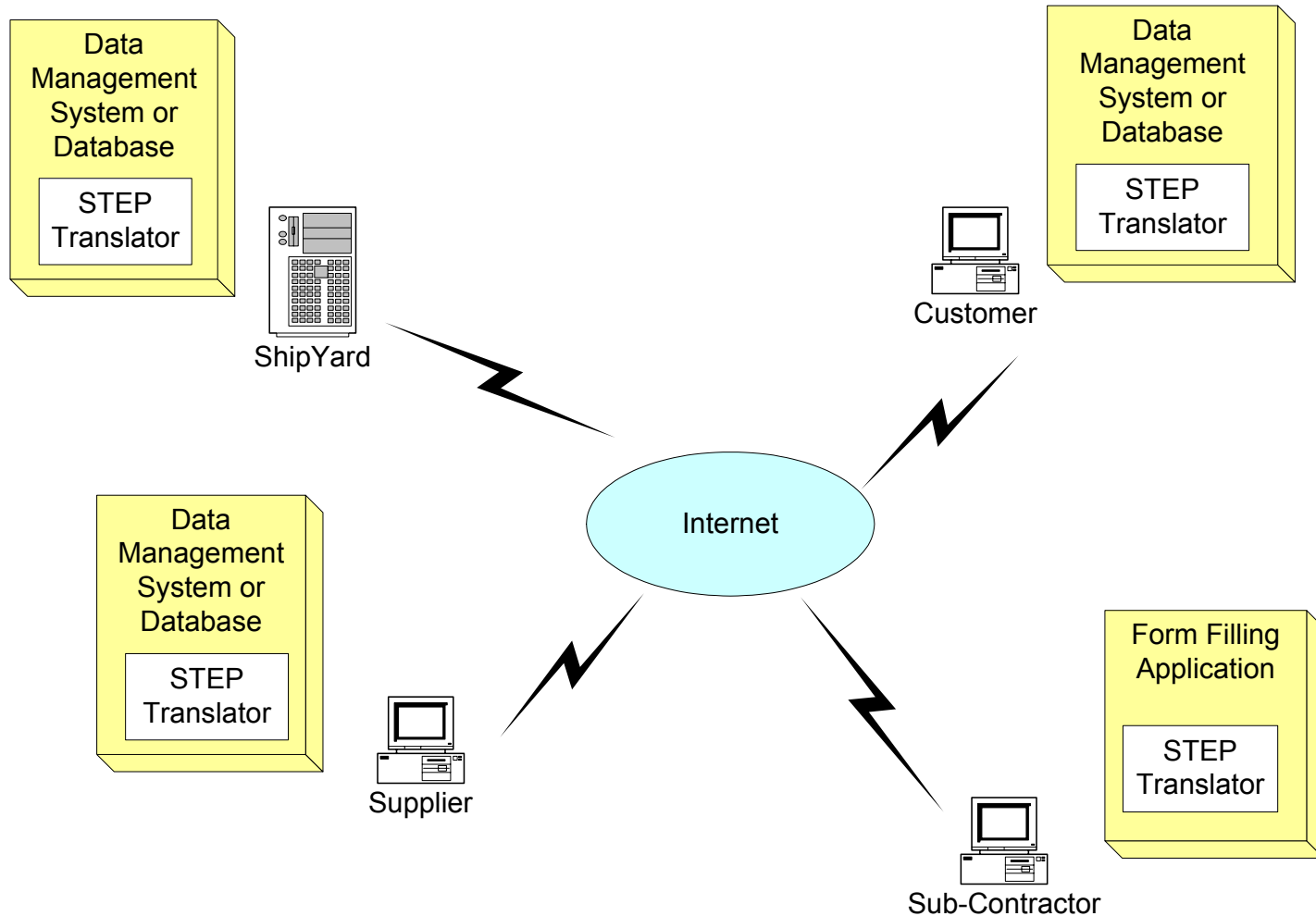
# Current Process

- Data exchange chanelns
  - Mail
  - Fax
  - E-mail
- Document formats
  - Word processor
  - Spreadsheets
  - Output of some ship maintenance systems



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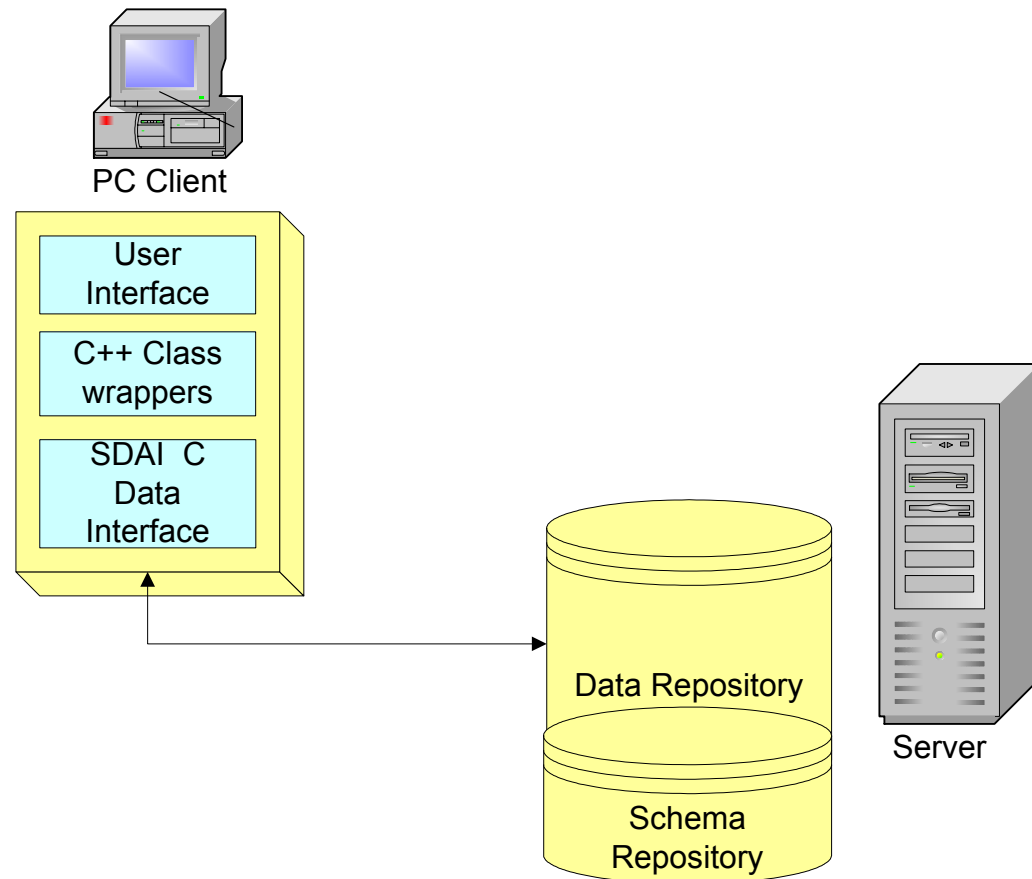
# Improved Process





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# Prototype Shipyard System





# System Implementation

- STEP Technology
- Database
- Translators

# Use of STEP Technology

- Data modelling
- Application Components
  - Repository
  - SDAI
  - EXPRESS compiler
- Scenarios
  - Data exchange - Part 21 physical files
  - Data sharing - common database



# Data Modelling

- EXPRESS schema
- Avoided Building Block methodology adopted in marine APs development
- To obtain:
  - Reduced levels of abstraction
  - Simpler database structure
  - Better mapping to application data structures



# Database

- Repository used as common database
- Object-oriented database
- Driven by EXPRESS schema

# Translators

- Data exchange:
  - STEP import/export
  - XML export
- Data representation:
  - HTML export

# Conclusions

- STEP tools and technologies can be used successfully out of the scope of the standards under development
- Presented application to the management of ship repair documents
- Common data model for database and data exchange
- Documents exchanged in standard computer readable formats
- STEP, XML and HTML translators implemented
- Documents ready for Internet based exchange and representation
- Improved efficiency of tendering negotiation processes
- Overall improvement of ship repair process